

REMARKS

Claims 1-27 are pending in the present application. Claims 1-5, and 7-27 were rejected under 35 U.S.C. §102(a) as being unpatentable over Leiter, U.S. Patent No. 5,022,744 in view of Pierrat, U.S. Patent No. 6,023,328. Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Leiter in view of Pierrat, and further in view of Weiss, U.S. Patent App. Pub. No. 2003/0011910 A1.

Reconsideration of the application is respectfully requested.

Rejections of Claims 1-5 and 7-27 under 35 U.S.C. §103(a)

Claims 1-5, and 7-27 were rejected under 35 U.S.C. §102(a) as being unpatentable over Leiter in view of Pierrat.

Leiter describes a microscope in which a diaphragm 25 disposed in a lamp house 2 is used to keep illumination intensity constant when a filter 7, 8 is inserted to vary the color temperature of illuminating light. See col. 3, lines 1-4, and col. 3, line 65 to col. 4, line 3.

Pierrat describes a photomask inspection device including a lamp 20, condenser lens 30, mask 40, projection lens 50, optical control mechanism 80, and a test substrate 60. The optical control mechanism 80 is coupled to the illumination source 20, and the two lenses 30 and 50 and manipulates several parameters of the inspection system, including the wavelength of the light source, the filling factor, and the numerical aperture of the projection lens. Column 4, lines 42-48.

Independent claims 1 and 19 recite “an aperture device disposed in an illumination beam path” of a microscope for modifying the “numerical aperture” and a light source control device for controlling, upon a change of the numerical aperture by the aperture device, the light source so that “a light flux [passing] through the illuminating optical system remains substantially unchanged.”

It is respectfully submitted that the combination of Leiter and Pierrat do not teach or suggest either of those features as recited in claims 1 and 19.

Regarding Leiter, the Examiner admits that Leiter does not suggest the feature of controlling the numerical aperture and the light source. Furthermore, Applicants respectfully submit that Leiter fails to suggest the feature of a numerical aperture device, and that diaphragm(25) of Leiter cannot be deemed to be an aperture device as recited in the claims. The term “numerical aperture” is well known to those of ordinary skill in the art. As discussed in the present specification at paragraph [0003], a modification of the numerical

aperture of the illuminating optical system causes a change in the resolution achievable with the optical imaging system and a change in the contrast of the image generated using the optical imaging system. The location of the diaphragm 25 of Leiter makes it clear that a change in the diaphragm would not change the numerical aperture. Because the diaphragm 25 is disposed upstream of the light guide 5 (see Fig. 1 of Leiter), a change in the diaphragm could not cause a change in the resolution of the imaging system or change in the contrast of an image generated, as necessarily would be present upon a change in the numerical aperture.

Furthermore, Pierrat does not cure the deficiencies of Leiter. Specifically, Pierrat fails to suggest an aperture device disposed in an illumination beam path for modifying the numerical aperture. While Pierrat mentions that optical control mechanism 80 may control a number of optical parameters including the numerical aperture of the projection lens 50, there is no suggestion that this is being done so using an aperture device “disposed in an illumination beam path” as recited in claims 1 and 19. Optical control mechanism 80 is shown as being located outside of the beam of light 22 (See Fig. 1).

Moreover, Pierrat does not suggest the feature of a light source control device for controlling the light source so that “a light flux [passing] through the illuminating optical system remains substantially unchanged” upon a change of the numerical aperture by the aperture device. In fact, Pierrat is unconcerned with adjusting a light source to compensate for numerical aperture changes. Instead, Pierrat concerned with the optical effects resulting from magnification of an image. Pierrat describes using the inspection system to manipulate the magnification of the an image formed on the test wafer as compared to the image created using a stepper photolithography process. Column 4, lines 54-67. Because magnification of the image alters the light intensity of the image, Pierrat therefore describes using optical control mechanism 80 to “maintain an intensity profile that is equivalent to that produced during conventional stepper photolithography processes while creating a magnified image on the test substrate.” Column 4, lines 62-67. Thus, Pierrat teaches adjusting optical parameters to maintain an intensity profile between a magnified and unmagnified images, and suggests nothing about keeping light flux through the system substantially unchanged upon changing of the numerical aperture as recited in claims 1 and 19. Nor is light flux, which differs from light intensity, ever mentioned in Pierrat.

Withdrawal of the rejections of claims 1-5, and 7-27 under 35 U.S.C. §103(a) based on a combination of Leiter with Pierrat.

Rejections of Claim 6 under 35 U.S.C. §103(a)

Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Leiter in view of Pierrat, and further in view of Weiss.

Weiss describes a method for regulating the brightness of a light source in which a change in the spectrum of the light emitted by the light source 2, due to a change in the electrical power delivered to the light source, is compensated for using a variable optical filter 16. See abstract.

Weiss does not cure the deficiencies of Leiter and Pierrat, in that Weiss does not disclose the missing feature of a numerical aperture device disposed in an illumination beam path” of a microscope for modifying the “numerical aperture.” Weiss also fails to suggest a light source control device for controlling, upon a change of the numerical aperture by the aperture device, the light source so that “a light flux [passing] through the illuminating optical system remains substantially unchanged.”

Withdrawal of the rejection to claim 6 under 35 U.S.C. § 103(a) is respectfully requested.

CONCLUSION

It is respectfully submitted that the application is now in condition for allowance.

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Respectfully submitted,

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